BENCHMARKS

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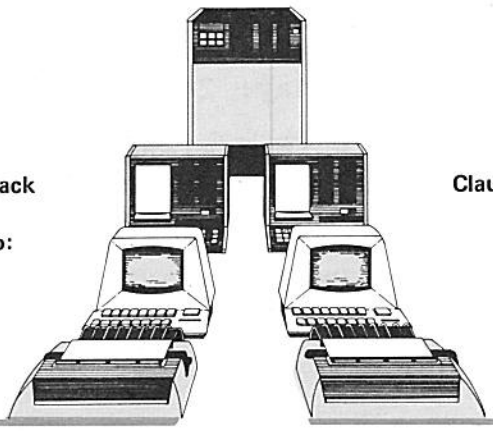

BENCHMARKS Reader/User feedback is encouraged.
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The NTSU Computing Center is located in the Information Sciences Building, Room 119; Telephone (817) 565-2324.

INFORMATION AND ID CODES - Carolyn Goodman.

NEWSLETTER QUESTIONS/CONTRIBUTIONS/ETC. - Claudia Lynch.

STATISTICAL/RESEARCH SUPPORT (provided for graduate students and faculty members) - George Morrow, Claudia Lynch, Steve Glick, and Victor Loos.

NON-RESEARCH STUDENT PROGRAMMING PROBLEMS - consultants from the Computer Science Department are located in GAB 550L. Student consulting provided by the College of Business is available at the BA Computing Access Facility.

JCL AND DEBUGGING PROBLEMS - George Morrow.

PRE-RESEARCH COUNSELING, INCLUDING SURVEY INSTRUMENT DESIGN - George Morrow, Claudia Lynch, Steve Glick, and Victor Loos

DATA ENTRY TO MUSIC, KEYPUNCH REQUESTS AND QUESTIONS REGARDING LAYOUT OF KEYPUNCH SHEETS - Betty Grise (ISB 227).

TEST SCORING AND ANALYSIS - Betty Grise.

ACADEMIC TIMESHARING INFORMATION AND/OR PROBLEMS: AS/8040, MUSIC (McGill University System for Interactive Computing) information and/or problems, including terminal problems - Steve Glick. VAX 11/780 information and/or problems - Kim Stickney. HP 2000 information and/or problems - Jeff Brooks.

ADMINISTRATIVE APPLICATIONS - Coy Hoggard.

AS/8040 COMPUTER HARDWARE/SOFTWARE/BILLING PROBLEMS - Sandy Franklin.

JOB SUBMISSION AND RETRIEVAL - RJE Operators.

Spring Computing Hours

Computing facilities will be open during the following times throughout the Spring semester (not applicable to holidays):

Computing Center RJE:	7 AM Monday - Midnight Saturday; Noon-Midnight, Sunday.
ISB 110 Terminal Area:	7:30 AM-Midnight, Monday-Thursday; 7:30 AM-6 PM, Friday; 8:30 AM-7 PM Saturday; 2-10 PM, Sunday
COB RJE (BA):	8:15 AM - Midnight, Monday-Saturday; 12:15 PM - Midnight, Sunday.
5th Floor GAB:	8 AM-Midnight, Monday-Thursday; 8 AM - 10 PM,Friday; Noon-8 PM Saturday

ALTERED HOURS OF OPERATION

The following hours will be in effect over the Semester Break (March 17 - March 25):

Computing Center RJE	:	OPEN : 8 AM - Midnight, Monday-Saturday. Noon - Midnight, Sunday.
ISB Terminal Area (110)	:	CLOSED: Sunday, March 18. Satudray, March 24. OPEN : 8 AM - 5 PM, M-W-F Noon - 8 PM. TU-TH RESUME NORMAL HOURS - March 25.
College of Business RJE	:	CLOSE : 8 PM, March 16 REOPEN: Noon, March 22- RESUME NORMAL HOURS
5th Floor GAB	:	CLOSED: March 17, 18, 24. OPEN : 11 AM - 8 PM, Monday - Thursday. 11 AM - 5 PM, Friday. RESUME NORMAL HOURS - March 25.

```
* * * * * * * * * * * * * * *
*                           *
*  N E W  P O L I C I E S   *
*                           *
*          A N D            *
*                           *
*    P R O C E D U R E S    *
*                           *
* * * * * * * * * * * * * * *
```

New Manager of Academic Computing Hired

The position of Manager of Academic Computing, which was vacated by Tom Madron's promotion to Manager of Computing Services, has been filled at last. Bob Brookshire, who has been empolyed by the Computing Center for the past two years as a consultant in Academic Computing, is our new manager. Dr. Brookshire also holds a joint appointment with the Political Science Department here at NTSU.

Print Quality of the Laser Printer

Like most mechanical devices, the laser printer requires periodic preventive maintenance to keep working properly. As the time for this maintenance approaches, you may notice some degradation in the quality of the output. This degradation is not serious enough to present a problem for most applications, but may be a problem for users who are interested in printing a final draft of a thesis or dissertation.

In order to obtain the finest possible quality of output, users should schedule the submission of their print jobs for the period immediately FOLLOWING a preventive maintenance. Preventive maintenance takes place approximately every three weeks (it's hard to predict exactly, since it depends on how heavily the printer is being used, which varies through the semester). We will attempt to keep you informed of the scheduling of laser printer preventive maintenance through MUSIC News and VAX News.

RAQL Acquired

NTSU has acquired RAQL (pronounced Raquel), a Relational Algebraic Query Language, from McGill University. It is purported to bring a full relational processing capabililty to SAS, and no modification to existing SAS data sets is necessary to take advantage of RAQL's features. The query facilitly of RAQL combined with SAS's statistical, report writing and graphics capability results in what RAQL's authors call a very comprehensive data management package. RAQL can also be used as a stand-alone system, if users are not knowledgeable of SAS, and it is reported to run at reasonable expense on any teaching database.

Anyone interested in learning more about RAQL may contact either Steve Glick or Claudia Lynch at the Computing Center, 565-2324.

Multidimensional Scaling Programs Installed

A package of multidimensional scaling programs developed by Bell Telephone Laboratories has been installed at NTSU. A full list of these programs, along with references, was printed in Benchmarks, Vol. 2, No. 7, Nov./Dec., 1982. Briefly, these programs are:

- PREFMAP, a preference mapping program
- PARAMAP, a parametric mapping program
- PROFIT, a program for property fitting by regression
- HICLUST, a program for hierarchical clustering
- INDSCAL, a program for individual differences scaling
- MDPREF, a program for multidimensional preference scaling
- KYST, a nonmetric multidimensional scaling program
- MONANOVA, a program for monotone analysis of variance
- MDSCAL5M, a program for multidimensional scaling.

To access these programs, use the following EXEC statement in your MVS job control language: // EXEC BELLAB,PROGRAM=nnnnnn where nnnnnn is one of the program names above. Bell Labs, unfortunately, does not guarantee the accuracy of the programs, nor will they con-

sult with users on problems. Use them at your own risk. Two of the programs, KYST and MDPREF do not seem to run correctly, and we do not know why. We suggest using PROC ALSCAL in SAS as an alternative. For more information, see Benchmarks, Vol. 2, No. 7, or contact Bob Brookshire at the Computing Center.

Using the Computer for Research: Part XIII - BMDP: Biomedical and Other Computer Programs Continued

by Bob Brookshire

Saving BMDP Files: The /SAVE Paragraph

When you have a large number of BMDP program control statements, or a large amount of data on cards, it is often convenient to create a BMDP system file to store a basic set of commands and data in a file on disk in the OS operating system. This is accomplished through the use of the /SAVE paragraph in the BMDP program, and a DD statement in the Job Control Language portion of the program which describes the location of the saved set of commands and data. The saved set of data and instructions is then retrieved through commands in the /INPUT paragraph.

The /SAVE Paragraph

The format of the /SAVE paragraph is simple, and consists of four sentences. The first is the CODE sentence. This sentence gives a code name of up to eight letters which identifies the disk file in which the information is to be saved. This code name usually is the last part of the DSN (data set name) in the DD statement which describes the data set. For our example data, an appropriate CODE sentence might be CODE IS CLASS.

The next sentence in the /SAVE paragraph is the UNIT sentence. This sentence provides a number which serves as a pointer for BMDP so that it can find the correct DD statement in the Job Control Language which describes the location of the saved information. The number in the UNIT sentence can be any number from 8 to 25, and should correspond to the first two numbers in the DD statement (more about this in a minute). For our example data, the UNIT sentence might be: UNIT IS 9.

The third sentence in the /SAVE paragraph is the NEW sentence. This simply tells BMDP that we are creating a new data set. The format of this sentence is merely: NEW.

The fourth sentence in the /SAVE paragraph is the LABEL sentence. This sentence is optional, and provides a label for the data set that contains up to 40 characters of information describing its contents. The label is sometimes necessary because the short CODE name may not adequately remind you of what it is that you have saved in the file. An example of the LABEL sentence is: LABEL IS 'SAVED FILE OF CLASS DATA'. Note that the label is enclosed by single quote marks (apostrophes), and ends with a period.

An example of the use of the /SAVE paragraph is contained in the program shown in Table 1.2 below. In this example, it is the last paragraph in the program, just before the /END statement. Following the end statement is the data to be analyzed.

The DD Statement for the Saved BMDP File

(The discussion in this section assumes that you are already familiar with the general format of the DD Job Control Language statement. Saving a BMDP file of control language and data requires a special DD statement in the Job Control Language portion of the program. The general format of this statement is:

```
//FTnnF001 DD DSN=USER.XXYY.codename,
// VOL=SER=ACAD0y,DISP=(NEW,KEEP),
// UNIT=SYSDA,SPACE=(TRK,(100,100),RLSE),
// DCB=(BLKSIZE=19069,LRECL=19065,RECFM=VBS)
```

The 'nn' in the ddname should correspond to the number in the UNIT sentence in the /SAVE paragraph. For example, if you used the sentence: UNIT IS 9. The 'XXYY' in the data set name (DSN) should be the same as your batch ID-code. The last part of the DSN should be the code name specified in the CODE sentence of the /SAVE paragraph. The 'y' in the disk name (ACAD0y) may have the value 0, 1 or 2.

An example of the use of the DD statement in conjunction with the /SAVE paragraph is provided in Table 1.2 where the 5th through the 8th statements in the program describe the saved BMDP data set. Note that the ddname and DSN correspond to the UNIT and CODE statments in the /SAVE paragraph of the program.

Retrieving Saved BMDP Files

Since the purpose of saving data and control language information in a BMDP file is to make it more convenient to use the same data set several times, it is important to know how to retrieve the BMDP file after you have created it. This requires the use of a DD statement and some new sentences in the /INPUT paragraph.

The DD statement for retrieving a saved BMDP data set has the same basic format as the DD statment used in creating the file. Note that the disposition (DISP) of the file being retrieved is no longer NEW, but is now OLD since it was previously created. And, since this is not a new data set, the SPACE and DCB parameters are unnecessary, and should be omitted. Statements 5 and 6 in Table 1.4 show how the file created in the program shown in Table 1.2 can be retrieved.

Normally, the /INPUT paragraph provides BMDP with information about the characteristics of the data being analyzed. With a saved BMDP file, however, this information is not necessary, since it is contained in the file being retrieved. Therefore, when retrieving a saved BMDP file, you need only specify the CODE and UNIT of the saved file. The program shown in Table 1.4 gives and example of this. Note that this program is much shorter than the program which created the BMDP file, shown in Table 1.2. The /INPUT paragraph has only two sentences, and the /VARIABLE and /GROUP paragraphs have been omitted, as well as the /TRANSFORM paragraph. BMDP stored all of the information in these paragraphs at the time the file was saved, so we do not need to provide it again.

Further information about BMDP files can be found in the BMDP Manual, pp. 65-72.

Two-Way Frequency Tables: BMDP4F

BMDP4F is a program that constructs two or higher way frequency tables from raw data, and calculates measures of association for tabular data (i.e. input to the program may be in either raw data or tabular form). For our example data, it might be interesting to collapse the scores for the second test into grade categories, using the CUTPOINTS sentence in the /GROUP paragraph, and to crosstabulate these grades by the gender of the students. We can, at the same time, calculate the average score for each student of all three tests, and create a BMDP file which contains the program control information describing the variables and the data.

The /TABLE Paragraph

The tables BMDP4F is to analyze are described in a /TABLE paragraph. The format of this paragraph is simple: it contains two sentences, one specifying the ROWS of the table, the other specifying the COLUMNS. More than one /TABLE paragraph can be included in a single BMDP4F program, in which case the program will construct a separate table following the directions in each paragraph.

The /PRINT Paragraph

As mentioned before, most BMDP programs allow you to use a /PRINT paragraph to request the printing of additional statistics or information. In BMDP4F, the /PRINT paragraph is used to request the percentages each of the cells in the table make up of the rows, the columns, or the total. This is done through a PERCENTS sentence which can specify ROWS, COLUMNS, TOTAL, or any combination of these.

The /STATISTICS Paragraph

Many measures of association for tabular data are available in BMDP4F, more than in any other statistical package. Table 1.1 lists the available statistics. You can specify which of these statistics you want calculated by including a /STATISTICS paragraph which specifies the names of the statistics as its sentences. The abbreviations BMDP recognizes for the names of the statistics are shown in the BMDP Manual.

TABLE 1.1: STATISTICS AVAILABLE IN BMDP4F

Chi Square	Likelihood Ratio
Yate's Chi Square	Fisher's Exact Test
Contingency Coefficient	Phi
Cramer's V	Yule's Q
Cross-Product Ratio	Mantel-Haenszel
Tetrachoric Correlation	Gamma
Kendall's Tau B	Stuart's Tau C
Pearson's Correlation	Spearman's Correlation
Somer's D	Goodman & Kruskal Tau
Lambda	Lambda *
Uncertainty Coefficient	McNemar Test of Symmetry
Test of Linear Trend	

Example BMDP4F Program

Table 1.2 shows an example of a program using BMDP4F, as well as of the /SAVE paragraph and its associated DD statement discussed in the previous section.

The first two statements, as in the program shown in Table 1.2, are statements which direct the MUSIC operating system to submit the job to the OS/MVS operating system. The next statement is the JOB statement, which contains the jobname (SA99BMDP), the ID-code of the programmer (XXYY), his estimate of the CPU time the job will require (5 seconds) and the number of lines it will print (1,000), his name (Philip Jones), and his batch password (SECRET).

The next statement is the EXEC statement, following the format shown previously. We have requested some additional workspace (WRKSPCE=48) for this program, since we are creating the BMDP file.

The next four lines in the program are the DD statement which specify the location and allocate the space for the saved BMDP file. Following these commands is the statement (SYSIN DD) which announces the end of the Job Control Language and the beginning of the BMDP program control statments.

The CUTPOINTS and NAMES sentences in the /GROUP paragraph are used to create grade categories from the test scores in variable TEST2, the fourth variable in our data set. We assign these categories the letter grades F, D, C, B and A as names.

Following the /GROUP paragraph are three paragraphs that request BMDP4F to construct a particular table, in this case one in which the columns are the letter grade categories of TEST2 and the rows are the variable GENDER, print the row and column percentages, and calculate a Chi-Square statistic for the table.

Following the specifications for the analysis, a /SAVE paragraph tells BMDP4F:

- The DD statement which describes the location of the new file has the ddname FT09F001 (UNIT IS 9.)
- The last part of the data set name (DSN) of the new file is the word 'class' (CODE IS CLASS.)
- This is a new file being created in this program (NEW.)
- The label for this file is 'Saved File of Class Data'.

The /SAVE paragraph and the FT09F001 DD statement are not required to use BMDP4F, but in this program we are both requesting a crosstabular analysis and saving the data and its descriptive information in a file on disk.

The last part of the program control information is the /END paragraph, followed by the MUSIC command which will append the data file to the program.

TABLE 1.2: EXAMPLE PROGRAM FOR BMDP4F

```
/INC OSJE
SYSTEM='OS',TYPE='STUDENT'
//SA99BMDP JOB (XXYY,:05,1),'JONES, PHILIP',PASSWORD=SECRET
//  EXEC BIMED,PROG=BMDP4F,WRKSPCE=48
//FT09F001 DD DSN=USER.XXYY.CLASS,
//  UNIT=SYSDA,DISP=(NEW,KEEP),
//  VOL=SER=ACAD00,SPACE=(TRK,(10,10),RLSE),
//  DCB=(BLKSIZE=13030,LRECL=13026,RECFM=VBS)
//SYSIN DD *
 /PROBLEM TITLE IS 'BMDP4F: CROSSTABULAR ANALYSIS'.
 /INPUT   VARIABLES ARE 5.
          CASES ARE 20.
          FORMAT IS '(F2.0,A1,3F2.0)'.
 /VARIABLE
     NAMES ARE ID,GENDER,TEST1,TEST2,TEST3,AVERAGE.
     ADD IS 1.
 /TRANSFORM IF (GENDER EQ CHAR(M)) THEN GENDER = 1.
            IF (GENDER EQ CHAR(F)) THEN GENDER = 2.
            AVERAGE = (TEST1 + TEST2 + TEST3)/3.
 /GROUP CODES (2) ARE 1,2.
       NAMES (2) ARE MALE,FEMALE.
       CUTPOINTS (4) ARE 65,70,80,90.
       NAMES (4) ARE F,D,C,B,A.
 /TABLE COLUMNS ARE TEST2. ROWS ARE GENDER.
 /PRINT PERCENT ARE ROW, COL.
 /STATISTICS CHISQUARE.
 /SAVE  UNIT IS 9. CODE IS CLASS. NEW.
       LABEL IS 'SAVED FILE OF CLASS DATA'.
 /END
/INC CLASS.DATA
```

EXAMPLE BMDP4F OUTPUT Table 1.3 shows the output from the program presented in Table 1.2. The first page of the output gives us some information about BMDP in general, and BMDP4F in particular, and echoes the program control information we provided in our program.

TABLE 1.3: EXAMPLE OUTPUT FROM BMDP4F

```
PAGE 1

BMDP4F
TWO-WAY FREQUENCY TABLES -- MEASURES OF ASSOCIATION
MULTIWAY FREQUENCY TABLES -- LOGLINEAR MODELS

DEPARTMENT OF BIOMATHEMATICS
UNIVERSITY OF CALIFORNIA, LOS ANGELES, CA 90024
(213) 825-5940          TWX  UCLA LSA
PROGRAM REVISED JUNE 1981
MANUAL REVISED -- 1981
COPYRIGHT (C) 1981 REGENTS OF UNIVERSITY OF CALIFORNIA
    JULY  2, 1982 AT 11:34:39

TO SEE REMARKS AND A SUMMARY OF NEW FEATURES FOR
THIS PROGRAM, STATE NEWS. IN THE PRINT PARAGRAPH.

PROGRAM CONTROL INFORMATION

/PROBLEM TITLE IS 'BMDP4F: CROSSTABULAR ANALYSIS'.
/INPUT   VARIABLES ARE 5.
         CASES ARE 20.
         FORMAT IS '(F2.0,A1,3F2.0)'.
/VARIABLE
     NAMES ARE ID,GENDER,TEST1,TEST2,TEST3,AVERAGE.
     ADD IS 1.
/TRANSFORM IF (GENDER EQ CHAR(M)) THEN GENDER = 1.
           IF (GENDER EQ CHAR(F)) THEN GENDER = 2.
           AVERAGE = (TEST1 + TEST2 + TEST3)/3.
/GROUP CODES (2) ARE 1,2.
       NAMES (2) ARE MALE,FEMALE.
       CUTPOINTS (4) ARE 65,70,80,90.
       NAMES (4) ARE F,D,C,B,A.
/TABLE COLUMNS ARE TEST2. ROWS ARE GENDER.
/PRINT PERCENT ARE ROW, COL.
/STATISTICS CHISQUARE.
/SAVE  UNIT IS 9. CODE IS CLASS. NEW.
       LABEL IS 'SAVED FILE OF CLASS DATA'.
/END
```

TABLE 1.3: EXAMPLE OUTPUT FROM BMDP4F CONTINUED

```
PROBLEM TITLE IS
BMDP4F: CROSSTABULAR ANALYSIS

NUMBER OF VARIABLES TO READ IN. . . . . .      5
NUMBER OF VARIABLES ADDED BY TRANSFORMATIONS.  1
TOTAL NUMBER OF VARIABLES . . . . . .          6
NUMBER OF CASES TO READ IN. . . . . .         20
CASE LABELING VARIABLES . . . . . .
MISSING VALUES CHECKED BEFORE OR AFTER TRANS. . NEITHER
BLANKS ARE. . . . . . . . . . . . . . . . . . MISSING
INPUT UNIT NUMBER . . . . . .                  5
REWIND INPUT UNIT PRIOR TO READING. . DATA. . .  NO
NUMBER OF WORDS OF DYNAMIC STORAGE. . . . . .  11262
NUMBER OF CASES DESCRIBED BY INPUT FORMAT . . .    1

***** TRAN     PARAGRAPH IS USED *****

VARIABLES TO BE USED
     1 ID          2 GENDER      3 TEST1      4 TEST2
     5 TEST3       6 AVERAGE

INPUT FORMAT IS
(F2.0,A1,3F2.0)
```

The second page of the output shows the columns of the data fields BMDP will assign to each variable,i.e. its interpretation of the FORMAT sentence in the /INPUT paragraph. Next comes the interpretation of the /TABLE paragraph and the associated /PRINT and /STATISTICS paragraphs. It tells us we have only requested one table, TEST2 by GENDER. BMDP4F will print the tables of observed and excluded values, and the contents of the first five cases with unacceptable (missing) values, whether we ask it to or not (by default). Next, it informs us it will print the row and column percentages and compute Chi Square as we have asked.

The next set of statements inform us of the progress in the creation of the BMDP saved file. It tells us the CODE, LABEL and UNIT for the file, and tells us it has saved all of our variables, including the newly created one, AVERAGE. It has saved 20 cases of data, which is the same number that it read in--it has therefore not lost any data.

Finally, the program presents us with some summary statistics for the variables in the requested table, and shows us the categories into which these variables are divided.

TABLE 1.3: EXAMPLE OUTPUT FROM BMDP4F CONTINUED

```
MAXIMUM LENGTH DATA RECORD IS    9 CHARACTERS.

 I N P U T  V A R I A B L E S . . . . .
    VARIABLE     RECORD    COLUMNS     FIELD    TYPE
   INDEX  NAME     NO.   BEGIN  END    WIDTH
   -----  -------- ----   -----  -----  -----    ----
       1  ID          1       1      2      2       F
       2  GENDER      1       3      3      1       A
       3  TEST1       1       4      5      2       F
       4  TEST2       1       6      7      2       F
       5  TEST3       1       8      9      2       F

   ***NOTE--REQUESTED OPTIONS ONLY ARE PRINTED BELOW.

   INTERPRETATION OF TABLE PARAGRAPH  1.
   -------------------------------------
     1  TABLES ARE REQUESTED --
   TABLE  1   TEST2       BY   GENDER

   INTERPRETATION OF PRINT PARAGRAPH --
   -----------------------------------
   PRINT TABLE OF  OBSERVED VALUES.
   PRINT TABLE OF  EXCLUDED VALUES.
   LIST FIRST    5 CASES WITH UNACCEPTABLE VALUES.
   PRINT PERCENTS OF ROW TOTALS.
   PRINT PERCENTS OF COLUMN TOTALS.

   INTERPRETATION OF THE STATISTICS PARAGRAPH --
   ---------------------------------------------
   COMPUTE CHI-SQUARE STATISTICS.
   .sp
  ----------------------------------------
  BMDP FILE IS BEING WRITTEN ON UNIT     9
  CODE. . . IS      CLASS
  CONTENT . IS      DATA
  LABEL . . IS
  SAVED FILE OF CLASS DATA
  VARIABLES ARE
       1 ID          2 GENDER      3 TEST1       4 TEST2
       5 TEST3       6 AVERAGE

  BASED ON INPUT FORMAT SUPPLIED 1 RECORDS READ PER CASE.
```

TABLE 1.3: EXAMPLE OUTPUT FROM BMDP4F CONTINUED

```
BMDP   FILE ON UNIT  9 HAS BEEN COMPLETED.
----------------------------------------

NUMBER OF CASES WRITTEN TO FILE       20

NUMBER OF CASES READ. . . . . .          20


VARIABLE    MEAN   STANDARD   SMALLEST   LARGEST     TOTAL
NO. NAME           DEVIATION    VALUE     VALUE    FREQUENCY
 2 GENDER  1.50        0.51      1.00      2.00        20
 4 TEST1  84.60       20.55       0.0     98.00        20

VARIABLE      MINIMUM MAXIMUM MISSING CATEGORY CATEGORY
NO. NAME       LIMIT   LIMIT   CODE     CODE     NAME

  2 GENDER
                                        1.00000 MALE
                                        2.00000 FEMALE
  4 TEST2                                       F
                                                D
                                                C
                                                B
                                                A
```

The fourth page of output presents us with the results of the analysis. First we have the table we requested in the /TABLE paragraph. We can see that of the female students half got grades of A and half got grades of B on the second test, and that the male students had three 'A' grades, five grades of B, one C and one F. In the entire class, there were eight students with grades of A, ten with B, one with C and one with F, and there were ten females and ten males. Since there were no missing values in our data, all cases had complete data and the program does not print the table of unacceptable values.

The next two tables contain the row percentages and column percentages, respectively. The Chi Square statistic for these tables has a value of 2.5 with 3 degrees of freedom, and a minimum expected value of .5.

TABLE 1.3: EXAMPLE OUTPUT FROM BMDP4F CONTINUED

```
*************************
* TABLE PARAGRAPH   1   *
*************************

*****  OBSERVED FREQUENCY TABLE  1

GENDER                          TEST2
------                          ------
                F         D         C         B         A      TOTAL
-------------------------------------------------------------------
MALE            1         0         1         5         3 I       10
FEMALE          0         0         0         5         5 I       10
                                                          I--------
TOTAL           1         0         1        10         8 I       20

ALL CASES HAD COMPLETE DATA FOR THIS TABLE.


*****  PERCENTS OF ROW TOTALS -- TABLE   1

GENDER                          TEST2
------                          ------
                F         D         C         B         A      TOTAL
-------------------------------------------------------------------
MALE         10.0       0.0      10.0      50.0      30.0 I    100.0
FEMALE        0.0       0.0       0.0      50.0      50.0 I    100.0
                                                          I--------
TOTAL         5.0       0.0       5.0      50.0      40.0 I    100.0

*****  PERCENTS OF COLUMN TOTALS -- TABLE   1

GENDER                          TEST2
------                          ------
                F         D         C         B         A      TOTAL
-------------------------------------------------------------------
MALE        100.0       0.0     100.0      50.0      37.5 I     50.0
FEMALE        0.0       0.0       0.0      50.0      62.5 I     50.0
                                                          I--------
TOTAL       100.0     100.0     100.0     100.0     100.0 I    100.0


MINIMUM ESTIMATED EXPECTED VALUE IS      0.50

STATISTIC                          VALUE    D.F.     PROB.
PEARSON CHISQUARE                  2.500       3    0.4753

NUMBER OF INTEGER WORDS USED IN PRECEDING PROBLEM 870
CPU TIME USED      2.170 SECONDS
```

The final page of the program output indicates that there are no more analyses to be performed, and that the program has terminated normally.

TABLE 1.3: EXAMPLE OUTPUT FROM BMDP4F CONTINUED

```
PAGE    2
BMDP4F
TWO-WAY FREQUENCY TABLES -- MEASURES OF ASSOCIATION
MULTIWAY FREQUENCY TABLES -- LOGLINEAR MODELS

    JULY  2, 1982  AT 11:34:52

PROGRAM CONTROL INFORMATION


NO MORE CONTROL LANGUAGE.

PROGRAM TERMINATED
```

ANALYSIS OF VARIANCE: BMDP2V

BMDP2V is a program that calculates analysis of variance, analysis of covariance, and ANOVA and ANCOVA with repeated measures. For our example data, it might be interesting to test the hypothesis that the mean of the male students are not different from the mean of the females on the variable AVERAGE, the average grade for all tests. The /DESIGN paragraph is used to tell BMDP what type of analysis of variance or covariance is desired.

The /DESIGN Paragraph

Several sentences may be used with the /DESIGN paragraph. The DEPENDENT sentence specifies the variable on which the means of the groups are to be calculated. The GROUP sentence tells what variable contains the codes for the grouping factor(s) in the analysis. The COVARIATE sentence may be used to specify an analysis of covariance by naming the variable to be used as the covariate. The LEVEL sentence is used to specify the number of levels in a repeated measures analysis, if that is desired, and the NAME sentence provides a name for the repeated measures (within groups) factor.

In our example analysis, we need only the DEPENDENT and GROUP sentences, since we are not conducting an analysis of covariance or a repeated measures design. We would use the paragraph:

```
/DESIGN   DEPENDENT IS AVERAGE. GROUP IS GENDER.
```

to specify that we want to compare the group means for males and females on the variable AVERAGE. Further information on the /DESIGN paragraph and its sentences is provided in the BMDP Manual, pp. 359-387.

Example Program for BMDP2V

Table 1.4 shows an example of a program using BMDP2V. In this example, we see that according to the EXEC Job Control Language statement, the program BMDP2V is being used, and additional workspace is requested. The Job Control Language also contains a DD statement with the ddname FT09F001 showing the location of the previously saved BMDP data file.

Because we are using a saved BMDP file, the only BMDP statements necessary to describe the data are in the /INPUT paragraph, and show the CODE and UNIT for the data, as in the examples in the previous section.

Following the /INPUT paragraph is the /DESIGN paragraph, which specifies the analysis. The dependent variable is AVERAGE, and the variable that contains the group codes is GENDER. It is not necessary, in this example, to include a /GROUP paragraph with the names and codes, since that information is stored in the saved BMDP file. If we were not using a saved BMDP file, a /GROUP paragraph would be required.

TABLE 1.4: PROGRAM FOR BMDP2V

```
/INC OSJE
SYSTEM='OS',TYPE='STUDENT'
//SA99BMDP JOB (XXYY,:05,1),'JONES, PHILIP',PASSWORD=SECRET
//  EXEC BIMED,PROG=BMDP2V,WRKSPCE=48
//FT09F001 DD DSN=USER.XXYY.CLASS,UNIT=SYSDA,
//  DISP=(OLD,KEEP),VOL=SER=ACAD00
//SYSIN DD *
/PROBLEM TITLE IS 'BMDP2V: ANALYSIS OF VARIANCE'.
/INPUT   CODE IS CLASS.
         UNIT IS 9.
/DESIGN  DEPENDENT IS AVERAGE.
         GROUP IS GENDER.
/END
```

Example Output from BMDP2V

Table 1.5 shows the output from the example program in Table 1.4. The first part of the output is familiar from the examples in previous sections. On the first page of the printout, notice the section labelled DESIGN SPECIFICATIONS. This shows the numbers of the grouping variable and the dependent variable in the analysis.

TABLE 1.5: EXAMPLE OUTPUT FROM BMDP2V

```
PAGE 1

BMDP2V - ANALYSIS OF VARIANCE AND COVARIANCE
         WITH REPEATED MEASURES
DEPARTMENT OF BIOMATHEMATICS
UNIVERSITY OF CALIFORNIA, LOS ANGELES, CA 90024
(213) 825-5940          TWX  UCLA LSA
PROGRAM REVISED JUNE 1981
MANUAL REVISED -- 1981
COPYRIGHT (C) 1981 REGENTS OF UNIVERSITY OF CALIFORNIA
    JULY  8, 1982 AT 14:27:09

TO SEE REMARKS AND A SUMMARY OF NEW FEATURES FOR
THIS PROGRAM, STATE NEWS. IN THE PRINT PARAGRAPH.

PROGRAM CONTROL INFORMATION

/PROBLEM TITLE IS 'BMDP2V: ANALYSIS OF VARIANCE'.
/INPUT   CODE IS CLASS.
         UNIT IS 9.
/DESIGN  DEPENDENT IS AVERAGE.
         GROUP IS GENDER.
/END

PROBLEM TITLE IS
BMDP2V: ANALYSIS OF VARIANCE

NUMBER OF VARIABLES TO READ IN. . . . . .        6
NUMBER OF VARIABLES ADDED BY TRANSFORMATIONS. .  0
TOTAL NUMBER OF VARIABLES . . . . . .            6
NUMBER OF CASES TO READ IN. . . . . . TO END
CASE LABELING VARIABLES . . . . . .
MISSING VALUES CHECKED BEFORE OR AFTER TRANS. . NEITHER
BLANKS ARE. . . . . . MISSING
INPUT UNIT NUMBER . . . . . .                    9
REWIND INPUT UNIT PRIOR TO READING. . DATA. . .  YES
NUMBER OF WORDS OF DYNAMIC STORAGE. . . . . .    9726
```

TABLE 1.5: EXAMPLE OUTPUT FROM BMDP2V CONTINUED

```
INPUT BMDP FILE
CODE. . . IS      CLASS
CONTENT . IS      DATA
LABEL . . IS
SAVED FILE OF CLASS DATA
VARIABLES
     1 ID          2 GENDER      3 TEST1       4 TEST2
     5 TEST3       6 AVERAGE

VARIABLES TO BE USED
     1 ID          2 GENDER      3 TEST1       4 TEST2
     5 TEST3       6 AVERAGE

DESIGN SPECIFICATIONS

          GROUP =    2
          DEPEND =   6


VARIABLE      MINIMUM MAXIMUM MISSING CATEGORY CATEGORY
NO. NAME       LIMIT   LIMIT   CODE     CODE     NAME

  2 GENDER
                                        1.00000 MALE
                                        2.00000 FEMALE

NUMBER OF CASES READ. . . . . .    20
```

The second page of the output shows that there are 10 subjects in each of the GENDER groups, and shows the cell means for the dependent variable AVERAGE. We can see that there is some difference between the mean for males, 76.267, and the mean for females, 83.467. The analysis of variance will tell us whether this difference could be expected by chance, or reflects a real difference in the scores that would be obtained by the male and female populations as a whole. The marginal mean represents the mean score for the class as a whole. Next, the program presents the standard deviations for each GENDER group, and for the class as a whole.

TABLE 1.5: EXAMPLE OUTPUT FROM BMDP2V CONTINUED

```
PAGE     2        BMDP2V: ANALYSIS OF VARIANCE


GROUP STRUCTURE

 GENDER        COUNT
 MALE           10.
 FEMALE         10.

          CELL MEANS FOR  1-ST DEPENDENT VARIABLE

                                          MARGINAL
GENDER   =  MALE          FEMALE

AVERAGE      76.26666     83.46666     79.86666

COUNT            10           10           20

STANDARD DEVIATIONS FOR   1-ST DEPENDENT VARIABLE
GENDER   =  MALE          FEMALE

AVERAGE      27.38964      4.89444
```

The third page of output from the program presents the analysis of variance results. We can see that the F value for the test of the GENDER means is 0.67, and that this value has a probability of 42% of being arrived at by chance alone. We can conclude that the test scores in our sample data do not reflect meaningful differences in the population between males and females. (The F value labelled MEAN is a test that the mean of the class is significantly different from zero. It is not surprising that this value is statistically significant.)

TABLE 1.5: EXAMPLE OUTPUT FROM BMDP2V CONTINUED

PAGE 3 BMDP2V: ANALYSIS OF VARIANCE

ANALYSIS OF VARIANCE FOR 1-ST
DEPENDENT VARIABLE - AVERAGE

SOURCE	SUM OF SQUARES	DEGREES OF FREEDOM	MEAN SQUARE	F	TAIL PROB.
MEAN	127573.67589	1	127573.67589	329.58	0.0000
GENDER	259.20022	1	259.20022	0.67	0.4239
ERROR	6967.33264	18	387.07404		

NUMBER OF INTEGER WORDS USED IN PRECEDING PROBLEM 1766
CPU TIME USED 1.444 SECONDS

The final page of the program output contains the familiar statements that signal the completion of the BMDP procedure.

TABLE 1.5: EXAMPLE OUTPUT FROM BMDP2V CONTINUED

PAGE 4
BMDP2V - ANALYSIS OF VARIANCE AND COVARIANCE
WITH REPEATED MEASURES
JULY 8, 1982 AT 14:27:24

PROGRAM CONTROL INFORMATION

NO MORE CONTROL LANGUAGE.

PROGRAM TERMINATED

HOW BMDP HANDLES ERRORS

It is to be expected that you will occasionally, or even frequently, make errors in your BMDP program control statements. The package will print messages that can help you to find your errors quickly, and correct them.

Table 1.6 contains two example programs which have errors in BMDP program control statements. In the first example, the student has included a /TABLE paragraph in a program which requests the BMDP2V statistical procedure. The /TABLE paragraph is used in the program BMDP4F, which constructs tables, not in BMDP2V, which does analysis of variance.

In the second example, the student has misspelled the name of the variable GENDER in the /DESIGN paragraph of the program.

TABLE 1.6: EXAMPLE BMDP PROGRAMS WITH ERRORS

```
/INC OSJE
SYSTEM='OS',TYPE='STUDENT'
//MU44BMDP JOB (0123-6789,:05,1),'BLOW, JOSEPH',PASSWORD=SECRET
//  EXEC BIMED,PROG=BMDP2V,WRKSPCE=48
//FT09F001 DD DSN=USER.XXYY.CLASS,UNIT=SYSDA,
//  DISP=(OLD,KEEP),VOL=SER=ACAD00
//SYSIN DD *
/PROBLEM TITLE IS 'BMDP2V: ANALYSIS OF VARIANCE'.
/INPUT   CODE IS CLASS.
         UNIT IS 9.
/DESIGN  DEPENDENT IS AVERAGE.
         GROUP IS GENDER.
/TABLE   ROWS ARE GENDER. COLUMNS ARE AVERAGE.
/END


/INC OSJE
SYSTEM='OS',TYPE='STUDENT'
//MU44BMDP JOB (0123-6789,:05,1),'BLOW, JOSEPH',PASSWORD=SECRET
//  EXEC BIMED,PROG=BMDP2V,WRKSPCE=48
//FT09F001 DD DSN=USER.XXYY.CLASS,UNIT=SYSDA,
//  DISP=(OLD,KEEP),VOL=SER=ACAD00
//SYSIN DD *
/PROBLEM TITLE IS 'BMDP2V: ANALYSIS OF VARIANCE'.
/INPUT   CODE IS CLASS.
         UNIT IS 9.
/DESIGN  DEPENDENT IS AVERAGE.
         GROUP IS GINDER.
/END
```

Table 1.7 shows the messages BMDP will print when it encounters errors of these types. The first message states that extraneous information has been found in the program, and prints the language it considers to be unnecessary. It also prints several diagnoses of the reason for the error. We can see that the fourth diagnosis, that the extraneous information requests an option that is not defined for the program (BMDP2V) applies in this example BMDP will ignore these extraneous statements, and continue to process the rest of the control language. In this instance, since there are no further errors in the program, BMDP will complete the analysis and present the output show in Table 1.7.

The second example in Table 1.6 shows the response to the misspelled variable name. BMDP reports that in the GR (GROUP) sentence in the DES (DESIGN) paragraph, the word GINDER is not valid. We could compare this word with the variables in our data to determine how the variable should be spelled.

TABLE 1.7 : EXAMPLE BMDP ERROR MESSAGES

```
* * * WARNING * * * EXTRANEOUS INFORMATION FOUND IN
YOUR CONTROL LANGUAGE INPUT.  THE FOLLOWING HAS BEEN
IGNORED:

IN PARAGRAPH:  TABLE

/TABLE ROWS ARE GENDER. COLUMNS ARE AVERAGE.

THE MOST COMMON EXPLANATIONS FOR EXTRANEOUS CONTROL
LANGUAGE ARE:
- MISSPELLED PARAGRAPH OR SENTENCE NAME
- SENTENCE IN THE WRONG PARAGRAPH
- SENTENCE OR PARAGRAPH REPEARED UNEXPECTEDLY
- OPTION NOT DEFINED IN THIS PROGRAM
- MUTUALLY EXCLUSIVE OPTIONS SELECTED


* * * CONTROL LANGUAGE ERROR * * *
IN GR        SENTENCE OF THE DES       PARAGRAPH.
'GINDER  '   IS NOT AN ACCEPTABLE LIST ELEMENT.
```

CONCLUSION

This concludes my brief introduction to BMDP. It should be clear that any extensive use of this statistical package requires the purchase of the BMDP Manual, which provides a much more detailed discussion of many of the topics presented here. The presentation here should enable you to run simple analyses without too much trouble, however. The last two tables in this chapter provide lists of the names and functions of the statistical programs available in BMDP.

TABLE 1.8: PROGRAMS AVAILABLE IN BMDP 1983

Program Name	Type(s) of Analysis
BMDP1D	Simple data description and data management
BMDP2D	Detailed data description, including frequencies
BMDP3D	T-tests
BMDP4D	Single column frequencies
BMDP5D	Histograms and univariate plots
BMDP6D	Bivariate (scatter) plots
BMDP7D	Group descriptions using analysis of variance and histograms
BMDP8D	Correlations
BMDP9D	Multiway descriptions of groups

TABLE 1.8 : PROGRAMS AVAILABLE IN BMDP 1982 CONTINUED

Program Name	Type(s) of Analysis
BMDP4F	Two-way and multiway frequency tables, measures of association, log-linear models
BMDP1L	Life tables and survival functions
BMDP2L	Survival analysis with covariates
BMDP1M	Cluster analysis of variables
BMDP2M	Cluster analysis of cases
BMDP3M	Block clustering
BMDP4M	Factor analysis
BMDP6M	Canonical correlation analysis
BMDP7M	Stepwise discriminant analysis
BMDP8M	Boolean factor analysis
BMDP9M	Linear scores for preference pairs
BMDPAM	Description and estimation of missing data
BMDPKM	K-means clustering of cases
BMDP1R	Multiple linear regression
BMDP2R	Stepwise regression
BMDP3R	Nonlinear regression
BMDP4R	Regression on principal components
BMDP5R	Polynomial regression
BMDP6R	Partial correlation & regression
BMDP9R	All possible subsets regression
BMDPAR	Derivative free nonlinear regression
BMDPLR	Stepwise logistic regression
BMDP1S	Multipass transformations
BMDP3S	Nonparametric statistics
BMDP1T	Spectral analysis
BMDP2T	Box-Jenkins time series analysis
BMDP1V	One-way ANOVA and ANCOVA
BMDP2V	ANOVA & ANCOVA and repeated measures
BMDP3V	Mixed model analysis of variance
BMDP4V	General univariate and multivariate ANOVA & ANCOVA, repeated measures
BMDP8V	Mixed model analysis of variance with equal cell sizes

OPERATIONS

Backup Schedule for OS/MVS

OS/MVS disk packs (Academic and Administrative) are backed up daily, Tuesday through Saturday, from 4-6:30 AM, and Sunday from Midnight to 3 AM. A backup of all the operating systems and their contents is done once every two weeks at some low activity period over the weekend.

AS/8040 Performance Statistics for January, February

January Performance Summary*

System Type	Operating Hours Scheduled (OHS)	Maintenance Hours Planned (MHP)	Production Hours Planned (PHP)	Maintenance Hours Unplanned (MHU)	Actual Production Hours (APH)	System Uptime (SU)
VM/SP2	744	24.00	720.00	7.80	712.20	98.9%
MUSIC	744	43.08	700.92	35.61	665.31	94.9%
MVS/JES2	744	24.00	720.00	26.87	693.13	96.3%
COMPLETA	552	1.63	550.37	27.42	522.95	95.0%
ADABASA	552	0.92	551.08	36.62	514.46	93.4%

Lost Productivity Hours can be contributed to the following key causes*:

Unit Recpord and 3270 Terminal Equip. (IBM)

1. 3272 Terminal C.U. Failures	26.85 Hours

Terminal Control Systems (MEMOREX)

1. 1270 TCU Modifications	5.37 Hours

Miscellaneous

1. Undetermined Causes for System Restarts	4.97 Hours
2. MUSIC's End of Semester DASD Maintenance	1.77 Hours
3. COMPLETA/ADABASA Prog. Tuning/Improvements	15.09 Hours
4. MVS/JES2 System Implementation	24.00 Hours
5. MVS/JES2 System Tuning/Improvements	2.83 Hours
TOTAL	48.63 Hours
GRAND TOTAL	80.85 Hours

February Performance Summary*

System Type	Operating Hours Scheduled (OHS)	Maintenance Hours Planned (MHP)	Production Hours Planned (PHP)	Maintenance Hours Unplanned (MHU)	Actual Production Hours (APH)	System Uptime (SU)
VM/SP2	696	0.00	696.00	2.97	693.03	99.6%
MUSIC	696	19.20	676.80	7.36	669.44	98.4%
MVS/JES2	696	0.00	696.00	10.83	685.17	98.4%
COMPLETA	696	3.39	692.61	71.38	621.23	89.7%

Lost Productivity Hours can be contributed to the following key causes*:

CPU, Tape, and Disk Subsystem (NAS)

1.	CPU Control Storage Failure	2.18 Hours
2.	7835 DASD C.U. Failure	1.95 Hours
3.	7350 DASD Failure	0.50 Hours
	TOTAL	4.63 Hours

Miscellaneous

1.	Undetermined Causes for System Restarts	4.20 Hours
2.	MVS/JES2 System Tuning/Improvements	5.83 Hours
3.	COMPLETA Program Tuining/Improvements	22.65 Hours
4.	COMPLETA Program Failures	36.11 Hours
	TOTAL	68.79 Hours
	GRAND TOTAL	73.42 Hours

*NOTE 1: CPU availability will be approximately equal to VM's % Uptime.
*NOTE 2: SU = APH/PHP
*NOTE 3: APH = PHP - MHU
*NOTE 4: PHP = OHS - MHP
*NOTE 5: OHS = PHP + MHP
*NOTE 6: MUSIC's PLANNED MAINTENANCE HOURS includes 17.31 hours of system backup time in January and 19.20 hours of system backup time in February.

*Lost productivity is calculated on the greatest amount of elapsed time that any one of the production systems was unavailable for scheduled operation.

TO CALL MUSIC, DIAL: 565-3499;3989;3999;4025;4030;3899 or 3966 and enter either CALL 8040 or CALL 8300 (depending on whether you want 1200 or 300 BAUD communication) at the # prompt. You may have to depress the <ENTER> or <RETURN> key 8 to 10 times before the # prompt appears. You may also enter CALL 3270 if you wish to use the 3270 protocol conveter (for FULL-SCREEN Editing), but be prepared for this to be very slow if you have a 300 BAUD modem.

REMEMBER, MUSIC has an automatic sign-off feature. If you leave your terminal unattended or otherwise inactive for more than 10 minutes, you will be signed-off.

MUSIC Backup Hours

Following are the scheduled hours for the MUSIC backup. A message will be sent to all users signed-on to MUSIC approximately 10 minutes before the backups are begun, and will be in the form: ** MUSIC SHUT DOWN AT xxxxx AM - SCHEDULED BACKUP ** To find out the backup hours while signed-on to MUSIC, enter HELP HOURS

MUSIC Backup Hours

Tuesday	3 AM (for about 3 hours)	Weekly Backup
Wednesday-Saturday	4 AM (for about 2 hours)	Daily Backup
Saturday	Midnight (for about 2 hours)	Daily Backup

OPER Help File Back

The OPER Help facility is back on MUSIC and better than ever. Next time you Log-on, enter HELP OPER and take a look at the topics that are covered. There may be something present that you have just been dying to know.

```
* * * * * * * * * * * * * *
*                           *
*   V A X  1 1 / 7 8 0s     *
*                           *
* * * * * * * * * * * * * *
```

TO CALL THE VAXs, DIAL: 565-3499;3989;3999;4025;4030;3899 or 3966 and enter either CALL A780 or CALL B780, (depending on which system you want) at the # prompt. You may have to depress the <ENTER> or <RETURN> key 8 to 10 times before the # prompt appears.

VAX Backup Schedule

Incremental backups of both VAX systems are performed Monday through Thursday at 5 PM. Any files that have been created or changed are backed up. Users do not have to log out, but any files that are open at the time of the backup will NOT be backed up.

Full backups of both systems are done every Friday at 5 PM. Again, users do not have to log out, but any files that are open will not be backed up.

A "stand alone" backup of both systems is done on the last working day of the month. During this time, all system software, as well as user files, are backed up. The systems must be taken down for this backup, which usually will not last more than 1/2 hour. All users that are logged on will be warned of the impending backup, and must log out.

NOTE: No backups are taken on the weekends. Requests for restoration of files should be made via MAIL to the username OP00.

```
* * * * * * * * * * * * * *
*                           *
*     H P - 2 0 0 0         *
*                           *
* * * * * * * * * * * * * *
```

TO CALL THE HP, DIAL: 565-3499;3898;3999;4025;4030;3899 or 3966 and enter CALL 2000 at the # prompt. You may have to depress the <ENTER> or <RETURN> key 8 to 10 times before the # prompt appears.

HP 2000 Backup Schedule

Routine system backups are scheduled to be performed at the following times;

8:00 a.m. Monday through Friday for approximately 20 minutes.
4:00 p.m. Friday for approximately 1.5 hours.

```
* * * * * * * * * * * * * *
*                           *
*        M I C R O S        *
*                           *
* * * * * * * * * * * * * * *
```

Terminal/Micro Settings for Dial-up Access

When using a terminal or microcomputer to access the NTSU computer network over the phone lines, you must configure your device either by setting physical switches or by typing in the settings through the keyboard. Every terminal or microcomputer communications program has its own group of settings, some of which may seem very obscure. The following is a list of the essential settings which should remain constant across all terminals/micros. The obscure settings are much trickier. Perhaps the best approach to these settings is to use as many of the default settings as possible, refer to the documentation for explanations, and experiment. If you become completely frustrated, call the Computing Center. We may ask that you bring us a copy of your manual or even your device itself if the settings are unusually foreign.

Setting	Set to:	Comments
PARITY	NONE	OFF or DISABLE are equivalent settings.
BAUD	300	1200 if you have a 1200 baud modem and are dialing to a 1200 phone number. When using a multi-speed modem e.g. 300/1200 baud, DO NOT enable the AUTOBAUD feature.
STOP BITS	1	You may choose 2 or 1.5, but these are less efficient than 1.
DATA BITS	7	
WORDLENGTH	8	The term "wordlength" is used differently by different terminals/micros. So it possible that this may need to be set to 7 instead. Check your documentation.

Calling All IBM PC Owners

If you would like to get together with other owners to share mutual knowledge, compalin, or whatever, please send me a postcard with your name, address, and phone number. I will try to set up a meeting time for us.

Charles Schultz (IC17) MUSIC or VAX
Box 7705
Denton, Texas 76203

INDEX TO PAST ISSUES

In order to utilize BENCHMARKS to its fullest capacity and avoid redundancies, an index of previous issues containing information considered still pertinent to the NTSU Computing Center is included in each issue.

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	Printer Copy Policy	5/1	Jan/Feb/84	11

	SUBJECT	VOL/NO	MONTH/YEAR	PG
6.	SERVICES AVAILABLE			
	Tape Services	4/2	Mar/Apr/83	6
	Consulting Services Available to Student Programmers	5/1	Jan/Feb/84	2
	After-hours Assistance With Terminal and Network Problems	5/1	Jan/Feb/84	13
7.	SOFTWARE			
	A) General			
	TUIT-A System for the Analysis of Literary and Textual Materials	3/6	July/Aug/82	6
	Tape Management System Installed	4/1	Jan/Feb/83	4
	Stop Unwanted Scrolling, Take Two	4/3	May/June/83	13
	Operational Procedure HELP File Available	4/3	May/June/83	15
	IMSL Installed	4/4	July/Aug/83	8
	VTERM Program Available to Departments With TI PCs	4/5	Sept/Oct/83	9
	Full Screen Editing to General Computer Users Soon to be Available	4/5	Sept/Oct/83	9
	SHAZAM, It's Here!	4/5	Sept/Oct/83	18
	Foreign Tapes and the TMS	4/5	Sept/Oct/83	20
	MVS Comes to NTSU, Bringing Some Changes With It	4/6	Nov/Dec/83	2
	B) MUSIC			
	Change That Password	3/6	July/Aug/82	20
	STATPAK Manuals Available	3/7	Sept/Oct/82	24
	ASCII Terminals Under VM	3/7	Sept/Oct/82	24
	MUSIC Tricks	3/8	November/82	37
	Terminals Temporarily Relocated	3/8	November/82	38
	MUSIC System Upgraded	4/1	Jan/Feb/83	20
	Some Changes in the Context Editor in Version 5.1	4/1	Jan/Feb/83	21
	Note on the Full Screen Editor	4/1	Jan/Feb/83	26
	SIM is Dead	4/2	Mar/Apr/83	17
	Waterloo/SCRIPT Available Interactively On MUSIC	4/2	Mar/Apr/83	18
	Supported Terminal Types	4/2	Mar/Apr/83	19
	Microcomputers and MUSIC	4/2	Mar/Apr/83	19
	New MUSIC Utilities	4/3	May/June/83	14
	EDTSUB: Using the MUSIC Editor From Within a Program	4/4	July/Aug/83	34
	MUSIC Support for CMS and UNLOADED PDS Files on Tape	4/4	July/Aug/83	37
	Logging on to MUSIC Through the Local Area Network	4/5	Sept/Oct/83	26
	MUSIC Notes	4/5	Sept/Oct/83	29
	IBM Scientific Subroutines Now Available on MUSIC	4/6	Nov/Dec/83	27

SUBJECT	VOL/NO	MONTH/YEAR	PG
C) SPSS			
Doing Repeated Measures Analysis in MANOVA	3/7	Sept/Oct/82	10
A Report From the ISSUE Conference: SPSS-X and More	3/8	November/82	13
Doubly Multivariate Repeated Measures Designs Using MANOVA	3/8	November/82	19
Concatenation of Crosstabulations	3/8	November/82	24
ISSUE: An Organization for SPSS Users	4/2	Mar/Apr/83	14
SPSS-X Version 2.0A, Up and Running	4/5	Sept/Oct/83	25
USERPROC: LISTREL	4/6	Nov/Dec/83	24
D) SAS			
New Features of SAS 79.6	3/7	Sept/Oct/82	16
PROC COMPUTAB:SAS's Answer to VISICALC	3/7	Sept/Oct/82	23
SAS Ranked Hign in Datapro Survey	3/8	November/82	32
Manuals Available in Bookstore, Library	3/8	November/82	33
Punching a Job Setup From the SAS Sample Library	3/8	November/82	33
Recode Cautiously	3/8	November/82	34
TAPELABEL and TAPECOPY Inoperative Under TMS	4/1	Jan/Feb/83	18
SUGI: An Organization for You	4/2	Mar/Apr/83	15
PROC MATRIX: An Alternative to APL	4/2	Mar/Apr/83	16
Working With Fractions	4/2	Mar/Apr/83	16
SAS 82.3	4/4	July/Aug/83	17
SAS/OR Available	4/5	Sept/Oct/83	25
E) BMDP			
BMDP82 Installed	3/7	Sept/Oct/82	12
BMDP Makes it Easier	3/8	November/82	27
Pairwise Mean Comparisons With BMDP	4/6	Nov/Dec/83	24
F) The HP 2000			
Editing BASIC Programs	3/6	July/Aug/82	21
HP Notes	3/7	Sept/Oct/82	29
Ninety Students May Not Need Ninety ID's	4/3	May/June/82	16
G)The VAX 11/780s			
VAX Administrator Hired	4/4	July/Aug/83	38
Timeout	4/4	July/Aug/83	38
VAX/VMS Primer	4/4	July/Aug/83	38
Using the VAX/VMS 11/780 Systems	4/5	Sept/Oct/83	29
G) Microcomputers			
MUSIC Communications Program for CP/M	5/1	Jan/Feb/84	19
8. USAGE STATISTICS			
MUSIC Usage Statistics 1981-1982	3/7	Sept/Oct/82	25
HP-2000 Usage Statistics for '81-'82 Fiscal Year	3/7	Sept/Oct/82	29
OS/MVT Usage Statistics 1981-1982	3/8	November/82	40
9. PERFORMANCE STATISTICS			
AS/8040 Performance Statistics for September	4/5	Sept/Oct/83	24
AS/8040 Performance Statistics for October	4/6	Nov/Dec/83	23
AS/8040 Performance Statistics for November, December	5/1	Jan/Feb/84	15
9. UTILITY APPLICATIONS			
New Disk Mapping Utility	5/1	Jan/Feb/84	13

GIVE US SOME INPUT

With the same fervor that you usually associate with anything done by Academic Computing Services, the newsletter editor is planning to revamp this time-honoured document. One of the plans involves changing how past issues of BENCHMARKS are indexed. Please answer the following questions and return these to the Computing Center.

PLEASE INDICATE YOUR AGREEMENT WITH THE STATEMENTS BY MARKING T OR F IN THE BLANKS PROVIDED.

___ 1. I am satisfied with the current method of printing an index of back issues in every newsletter.

___ 2. I think that there should be an index, but printed as a seperate document once a semester.

___ 3. I think it is pointless to have an index of back issues.

4. Here are my views about an index for back issues of BENCHMARKS:

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BENCHMARKS is a vital link between the NTSU Computing Center and the users of our facilities. It is important for all users of the computing facilities to maintain a file of these newsletters because they contain materials which will periodically update existing documents as well as information and suggestions on uses of OS/MVS, MUSIC, the VAX 11/780's, the HP-2000, and other resources available to NTSU students and faculty. To facilitate the dispersal of BENCHMARKS, *** FREE *** subscriptions are now available. To receive yours, send the following information to us either by "snail mail" (the post office or campus mail) or electronically, through the MAIL facility on MUSIC.

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